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## PSYCHOLOGICAL AND ENVIRONMENTAL STUDY OF WOMEN CRIMINALS.

### I.

ONE of the charges most frequently brought against sociology is that it consists only of theories, and these often of doubtful practicability. It is said its basis of fact is not sufficient to warrant its claim to the distinction of being a science. If this is the light in which it is often regarded, how can it be made more accurate, more scientific? This was the problem which at the outset confronted this investigation in criminal sociology. In this, perhaps, more than in any of the other branches, the way has been paved for scientific observation. Anthropometry and the metric system have already been brought to its aid, trained specialists have made the observations, and much statistical work has been done in relation to the social phenomena.

For the purpose of ascertaining the value and applicability of these anthropometric measurements to the female criminal in this country, and for the purpose of securing additional light upon the problem, an investigation was conducted by the writer during the summer, which consisted in visiting five institutions—the reform school at Geneva, penitentiary at Joliet, workhouse at Cincinnati, Ohio State Penitentiary at Columbus, and the workhouse and penitentiary at Blackwell's Island, New York city. At these institutions a laboratory was arranged in which the measurements and tests were made. Free access was had to the records of the institutions and to the prisoners, and every facility was afforded for an exhaustive study. The results presented in the following pages are gleaned from sixty-one criminals measured, these being compared with the measurements of fifty-five students. These results are divisible into three categories: the anthropometric and psychological, taken in the laboratory, and the sociological, which was secured by observing and interrogating large numbers of prisoners, by an examination of the records, by

conversations with officers, and by visits to the districts from which these inmates come. The results are best presented by observing these divisions.

Most of the investigation among criminals has been upon the anatomy, the functioning in society, the mental, moral, and emotional nature being neglected. The criminal has been regarded as a result, as a finished product, rather than as an individual in a state of evolution, as an organism responding and reacting to various stimuli. America has had but few students in the scientific study of the criminal, and thus the results of Lombroso, Ferri, Tarnowsky, and other European investigators have been largely accepted, and have had a much wider application than even their authors intended. What are some of these results, and are they applicable to American criminals?

Lombroso represents the work best, and is its originator. His investigations have been very minute and cover a broad field. He has examined the skulls, making a large number of measurements, and carefully noting anomalies; he has studied the brains of criminals, and also the anatomy, using anthropometry for a large number of measurements. Cephalic and facial anomalies, expression, weight, height, etc., have also been noted. Some meager observations in touch, sight, hearing, and taste have also been made. From these observations are formulated the theories which are so well known—such as the classification of born and occasional criminals, explanation of crime on the grounds of heredity and atavism, theory that the criminal is a degenerate and presents numerous defects and anomalies. Were man's structure all, with these conclusions no fault could be found; but there remain the mental and emotional impulses, the tremendous forces of social and economic environment, to be reckoned with; for man's life is but the response of the former to the latter.

In the hope of ascertaining if these facts were true for American female offenders, a series of twenty measurements was selected. It was hoped these would be comparable with Lombroso's results. America does not offer the facility for studying the skulls and brains of deceased criminals, so the measurements are limited to the anatomical. The series consisted of twenty

measurements, which included the following: weight, height, sitting height, strength of chest, hand grasp, cephalic index, distance between arches, between orbits, corners of eyes, crown to chin, nasal index, length of ears, of hands, of middle fingers, of thumbs, width and thickness of mouth, height of forehead, anterior and posterior diameters. Viewed from the standpoint of Lombroso's theory of atavism, all of these measurements have a bearing upon the relation of heredity and environment to crime. Emphasizing the former, Lombroso believes that the criminal possesses more degenerate characteristics and stigmata than do other classes.

Before comparing the specific measurements, there are some general statements of fundamental importance which should be made regarding Lombroso's work.

The number of normals measured is so small that his deductions as to differences between normals and criminals must be accepted judiciously. The number of criminals given is 1,033; of normals, 225, who were taken from hospitals; 30 not in hospitals were measured.

His measurements have been so largely anthropometrical; the psychological and environmental side, including training, has been so largely neglected, that his conclusive statements regarding born and occasional criminals, and his dogmatisms about heredity and atavism, must be accepted with some hesitancy.

His tendency to work out theories of degeneracy upon such doubtful material as historic documents of 1492, and discuss physiognomy from pictures he admits are not authentic,<sup>1</sup> must render him liable to the charge of partiality for this theory.

His generalizations from a few cases have tended to mislead. Thus, his descriptions of typical murderers and of criminal expressions cannot be duplicated into a general rule, and are to be found without the prison walls as well as within them.

Turning now to my series of measurements, what are the results?

The following measurements I have not compared with his results: height, cephalic index, facial measurements, length of

<sup>1</sup>"Was Columbus Morally Irresponsible?" *Forum*, June, 1899.

hands, feet, fingers, thumbs, and ears. After working for a time among the various nationalities which the prisons here present, I found that nationality was so influential, that so much depended upon race, climate, soil, nutrition, etc., of the various countries, that these results must be compared with those of normals of the same race and conditions. This seems to demonstrate clearly that we cannot accept the statements that criminals are more brachycephalic than normals, when one has measured only Italians or Russians, and that this is an ethnic characteristic. It is just here that Lombroso's results are untrustworthy when applied to various races and countries. Where one is dealing with structure, and this is dependent upon climate, soil, atmosphere, food, geographical location, etc., data must be confined to the race from which they are gleaned, and not be extended to characterize all criminals, merely because they are such.

With reference to weight, Lombroso says prostitutes are often heavier. He says: "This greater weight among prostitutes is confirmed by the notorious fact of the obesity of those who grow old in their vile trade, and who become positive monsters of adipose tissue."<sup>1</sup> My observations show the average weight of the student to be 124 pounds; of the prostitute, 120 pounds; the maximum weight for any prostitute was 160. From a careful observation of some 400 women in the Blackwell's Island workhouse I was unable to verify his statement, as these women were not heavier than were those observable upon New York streets. He makes no note of the fact that there is a tendency toward obesity with increasing age, or that nutrition, sanitary conditions, labor, etc., influence this among both normals and criminals.

With reference to age, Lombroso states that prostitutes are long-lived.<sup>2</sup> This fact is not applicable to Americans. Dr. Sanger, once resident physician at Blackwell's Island, has studied the subject thoroughly in America, and says: "In Paris  $6\frac{2}{3}$  per cent. survive courtesan life for fourteen years; in New York, only  $2\frac{3}{4}$  per cent.; in Paris,  $17\frac{1}{2}$  per cent. survive the life for ten

<sup>1</sup> LOMBROSO, *Female Offender*, p. 50.

<sup>2</sup> *Ibid.*, pp. 127-9.

years, while in New York the percentage is  $3\frac{3}{4}$ ."\* He ascribes this great difference in longevity to the different social customs and economic necessities.

With regard to strength, Lombroso says there is no proof of extraordinary muscular force, which I found true. The student's tests with the dynamometer showed a stronger hand grasp than did those for the criminals. He finds, however, a greater percentage of left-handedness. My number was small.

From observations of the women measured, and of those resident in the workhouses, I am able to refer to other statements of Lombroso's.

He asserts that prostitutes possess, more frequently than normals, enormous lower jaws, projecting cheekbones, projecting ears, virile and Mongolian physiognomy, prehensile feet, masculine voices and handwriting. I am unable to verify these, and think that, especially in the first-named, racial influences again operate. I found faces with hard expressions, and voices harsh and cynical, but they did not possess the peculiar masculine quality, and I do not believe that harshness, cynicism, coarseness make them masculine. The handwriting, by reason of the difficulty with which many of them write, and the attention they give to mechanical construction, tends to make the letters larger and more uneven, but I should not characterize it as masculine.

Lombroso also states that the pilosity among prostitutes is more excessive, and there are more receding foreheads than among normals. Again I am unable to concur in this statement.

When the classes from which these people come, who are not criminal, but who have the same cultural and educational acquirements, are observed, it is difficult to determine any marked differences.

Mantegazza, another European investigator, who has given especial attention to physiognomy, says: "Women criminals are almost always homely, if not repulsive; many are masculine; have a large, ill-shaped mouth; small eyes; large, pointed nose, distant from the mouth; ears extended and irregularly planted."

\*SANGER, *History of Prostitution*, p. 485.

When describing such characteristics as homeliness and repulsiveness in the lowest classes, the effect of clothing, cleanliness, etc., must be considered, as deficiency in these particulars renders even a normal individual unattractive.

The other measurements, not referred to in detail, are those which I have devised for other results than a comparison with Lombroso's.

We now turn to a consideration of the psychological tests. These included tests for memory, color-blindness and color preference, qualities, sensibility of the skin, taste and smell, hearing, sight, fatigue, pain, precision, respiration, and association of ideas. So far as the writer is aware, this is the first attempt to secure a series of such measurements from female delinquents, and to compare the results with those from a different educational and social stratum of society. The series used was designed for the purpose of testing the five senses, the capacity for perception, coördination, and adjustment. The series was necessarily more incomplete than the writer desired. This was due to the complexity and bulk of psychological apparatus, much of which must be excluded in fitting up a portable laboratory, and to the fact that with the delinquent classes everything must be as simple as possible, so as not to arouse too great a suspicion and antagonism.

The purposes of this investigation I conceive to be three :

1. If crime is the result of the way in which the individual *functions* in society, and he adjusts himself by means of his senses, perceptive and coördinating faculties, what differences exist in these between the criminal and the normal individual who adjusts himself better ? Are there defects ? If so, to what are they due ?

2. Can psychology aid in the knotty problem of the influence of heredity and environment in producing crime ? Will psychology reveal the defects, and will the environment, which includes the cultural and educational influences, account for their existence ?

3. The closer union of psychology and sociology, thus rendering the latter more worthy of a scientific standing

Sociology needs some system of exact measurement to render its theories trustworthy and its concepts of practical value.

The method used in obtaining the results herein presented was to arrange the laboratory in some quiet place within the institution. With the coöperation of the matrons, such inmates were tested as were desirable and obtainable. The confidence and consent of the subject had to be secured, for they were extremely suspicious and superstitious of any investigation, especially where instruments were used. The measurements could not be made compulsory in any case. In the presentation of the details I shall give the test, its method, result, and comparative value, so far as I have been able to ascertain it. Where it has been possible to assign any reasons for existing facts, and where they have grown out of the investigation, I have appended them.

The first test given was that for memory. This consisted in reading a series of ten numerals. The first series contained four figures each, as 2835; the second, five, as 27914; the other, six; etc.; each series increasing in length. Immediately after the reading of each the subject was required to write them down as she thought they were read. This was continued until the point was reached where she committed three errors, transposed, substituted, or omitted a figure. This point indicated her ability for memorizing. When this was secured, the same test was repeated, only letters, as *x v h r, v l p x s*, were substituted for the figures. The letters were given for the purpose of preventing any advantage to those who had had special training in numerals, as mathematicians and bookkeepers.

The results show that the students possess much better memories. Where the memories of the criminals approximated to those of the students, I found them to possess superior educations. The courtesans had the most defective memories, the thieves and murderers being several grades higher. The reasons suggesting themselves for these differences were: the difficulty and hesitancy, due to defective education and lack of practice, with which the delinquents formed their numerals and letters. This withdrew the attention from the memorizing,



the consciousness of the mechanical work distracting them. Their concentration, by reason of defective mental training, was weaker than that of the student. They soon grew restless and found the task irksome. Even their desire to excel did not always prove strong enough to keep the mind from digressing. They were easily irritated and were exceedingly sensitive over their supposed errors. The greater defect among courtesans may be due to their greater ignorance, and habits which impair clearness of the mental faculties.

In the test for color-blindness, which is made with a series of wools, similar to that in use by railways in their examinations, I found no cases of color-blindness, though both criminals and students made errors in the assignment of doubtful shades of the blues and greens. In connection with this test I attempted to ascertain if it is true, as has been so often stated, that courtesans prefer and wear gaudy colors. I asked them to name the color they preferred for gowns and trimmings. The result shows the following selections: blue, 23; pink, 8; red, 5; yellow, 5; lavender, 3; black, purple, and green, 2 each. Observing the clothing of the women as they were brought into the workhouses, I found no one color markedly predominant. Courtesans belonging to the lowest classes often have little choice in the selection of colors, for this is frequently determined by other factors. Frequently they wear cast-off clothing; bright colors appeal more to the sensuous nature, and as these courtesans are almost always solicitors for patronage, they use them to attract attention; bright fabrics are cheaper than duller shades—these are economic reasons. Colors are often chosen because associates wear them, or because they are the custom in their environment—these are among the social reasons. Thus, these factors must be considered in an attempt at explanation. Preference and the colors worn are not necessarily the same.

Of suggestive interest rather than of definite psychological value was the test of qualities. The following list was given the subject, and she was instructed to choose from it the five which appealed to her most, which she would desire for herself or friends, care being taken to explain the exact meaning of

each where it was not understood: principle, honor, truth, justice, right, fellowship, sincerity, ambition, courage, purity, nobility, strength, sympathy, love, friendship, virtue. The results were: honor, 32; principle, 30; truth and purity, each 21; love, 18; justice and ambition, each 17; virtue, 15; nobility, 13; strength, 12; sympathy, 11; friendship, courage, fellowship, each 10; sincerity and right, 9 each. It will be noted that the stronger, more masculine qualities are more frequently chosen. Thus honor, principle, truth, justice were selected more frequently than love, sincerity, friendship, purity. I found that they used two methods of selection: the first, choosing what they desired for themselves; the second, what they desired for others, especially if through others they had fared badly. Thus principle, justice, truth often occurred because they felt their prosecutors and judge had not treated them fairly. Friendship is far down in the list, for they know few unselfish ones, and its mention often elicits a sneer; sympathy they appreciate, but it is often crowded out by the fierceness of the competitive struggle; sincerity they think does not pay, because it is not current coin within their community.

The sensibility of the skin was taken upon the forearm with an æsthesiometer. The method consists in pressing the two points of the instrument upon the skin. The points are adjustable and at the beginning are placed 30<sup>mm</sup> apart. Ten impressions are made, the subject stating each time if she feels two impressions or one. If the judgments are accurate, the points are moved nearer together and ten tests made. This is repeated until the point is found where only one point can be felt. Then the experiment is repeated, only instead of starting with the points wide apart they are close together, and are gradually widened until two pressures are discernible. The subject's eyes are closed during the experiment.

The tests demonstrated that the sensibility is greater with the students. For the right and left forearms the average was 16<sup>mm</sup>. For the criminals the average was, right, 24<sup>mm</sup>; left, 21<sup>mm</sup>. The lowest sensibility reached by a student was 26<sup>mm</sup>, the highest 6<sup>mm</sup>; among criminals the lowest was 42<sup>mm</sup>, the highest 16<sup>mm</sup>.

The averages for the reform-school girls more nearly approximated those of the students; those of the courtesans were farthest removed.

The reasons for this greater insensibility may be found in the nature of the occupation, nutrition, care of the body, habits tending to render the sensibilities less acute. Important also was their defective concentration. The greatest care had to be used to secure constant attention. Poor concentration tends to render the results inaccurate. Whether age is a factor I am unable to determine. Often the muscles were soft and the skin flabby, and a much greater pressure was required in order to secure a definite sensation.

The tests for taste and smell were next given. For taste solutions of salt, bitter, sweet, and sour were used, one drop of each being placed upon the end and sides of the tongue with a small brush. For smell four solutions each of camphor, bay rum, and cloves were given; each solution was of a different strength. The differences between delinquents and students were more marked in these than in any other tests. Instead of proving one of the current theories, that the criminal is allied to the savage, and is more dependent upon physical senses than upon his intellect, and thus has these more acutely developed, I found them to disprove it. In taste the delinquents were only about two-thirds as accurate as the students, in smell only about one-half.

The following reasons suggested themselves:

The eating of snuff, excessive use of alcohol and tobacco, destroy a fine sensibility to taste. The prostitutes use these to a greater extent than do the criminals, and their sensibility is much more obtuse. The coarse, strong foods used must tend to render fine discriminations impossible. Bad sanitary conditions and unsavory odors in the districts from which most of them come must affect the sense of smell, as do also such diseases, as catarrh, which are often allowed to exist unheeded. In the test for smell the power of association has a marked influence. Camphor, cloves, and bay rum were more familiar to the student. Sometimes the criminal would designate camphor as good for a

headache when she could not recall the name, or cloves for toothache. Without these associations they would not have recognized the odor. Definite associations make the results more favorable.

The test for hearing was the familiar one taken with a watch. One ear was closed with cotton, and the subject, with her eyes closed, was required to state when she heard the watch and when she did not. The watch was first held close to the ear, and gradually moved outward, until the judgment became inaccurate. Then the watch was started from a point where it could not be heard, and moved forward until the judgments were accurate. By this method numerous defects were found. For fifty-seven subjects I found the distance for the right was 4.7 feet; left, 5.4 feet. In twelve cases there were marked defects in both ears, or great discrepancies between the two.

In some cases I could ascertain no reasons; in others I found such causes as catarrhal and scrofulous diseases. Many defects were explained by the subject upon the ground of injuries, and, judging from the condition in which many of the women arrived at the workhouses, I am inclined to accept this as an explanation.

A fatigue test was taken for the purpose of ascertaining the extent of physical endurance and the amount of will-power. The subject was required to rest her hand upon the table so her index finger rested upon the pendulum of a pair of weighing scales suspended from a standard. At a signal she was required to pull the pendulum down as far as possible, and hold it steady for thirty seconds. The rate of decrease from the maximum pull to the minimum pull was taken as the indication of fatigue. The results show the students to have an inferior pull, but more endurance. The energy of the delinquent seemed to come in a burst, and was followed by a rapid decrease. The students showed greater conserving power. The maximum pull for the delinquents sometimes exceeded twelve pounds, while that of the students did not exceed ten. Average rate of decrease for the delinquents was 2.4 pounds; students, 1.6 pounds.

For ascertaining defects in eyesight, reading different sizes of type at a distance of four feet was used. The subject began

with the large sizes, and passed to the smaller sizes until she failed to read clearly and correctly. One eye was tested at a time. Twenty-four showed a marked difference between the two eyes. The difference between delinquents and students was found in both strength and acuteness. The former tire more readily, and the average shows that they failed at a size twice as large as that upon which the students failed.

This may be due in part to the following reasons: The delinquents were older than the students. On the other hand, however, the physician at the reform school states that of the girls received there about two-thirds have defective vision. The students have read more and assist themselves more readily by association of words and phrases. The hesitancy with which the delinquents read and pronounce tends to render their perception of words less accurate. The irregularity of habits and excessive use of the eyes during night hours, often under glaring lights, must tend to weaken them, as does also the use of strong stimulants.

The tests for pain were made upon the temporal muscle with an instrument which registers the amount of pressure required to produce a just discernible painful sensation. When the subject feels the sensation of pain, she indicates it, the pressure is stopped, and the reading taken. Three tests were made upon each temporal muscle, and the average used. For the students the amount required was: right, 2,018 grams; left, 1,922; reform school: right, 2,159; left, 2,105; delinquents: right 3,243; left, 3,159. My results confirm the statement that the left side is more sensitive than the right.

Dr. MacDonald has advanced the theory that luxuries and refinements tend to increase this sensitiveness. As these are incident to higher cultural and educational standards, they would support the hypothesis herein presented. One peculiarity of criminals is noteworthy: while they have an extreme *fear* of pain, they *endure* it without complaint when it is actually applied.

A test for securing the coördination of eye and hand was next given. A blank containing a number of small circles, as arranged on a target, was placed upon the wall. The subject

was seated in front of it and was required to strike as near the center as possible, ten times in regular, rapid succession. A pencil was used, and was sent forward and back from the shoulder. The nearness to the center of the pencil dots indicated the degree of accuracy. In this also the students were more accurate. Any neurotic conditions were clearly shown by this test.

The longest and most difficult test for the subject to comprehend was that of association of ideas. It consisted in giving the subject a word, as "house" or "tree," and having her write her associations with the word. One minute was the time allowed for each word. She wrote down only one word for each idea, thus securing more associations within the time allowed. After the word was given she had the privilege of writing down anything that came to her, whether it was connected with the word or not. While the associations were still fresh, they were analyzed, the subject telling that of which she thought in each instance. The tests made in this way are divisible into four groups: one series, consisting of the words "rainbow" (visual), "thunder" (auditory), "pain" (tactual), "sour" (gustatory), "ammonia" (olfactory), was given for the purpose of determining to what extent each memory prevailed. Thus, if "rainbow" was given and was followed by the names of colors, the visual still persisted; but if rain were heard, or they felt afraid, the visual was lost. So throughout the series. The second consisted in giving more abstract words, these being "mind," "habit," "value," "marriage," "religion." The words were also selected with a view to bring out the mental and moral attitude, and social influences. Thus, under "habits" they frequently enumerated all evil ones; under "value" could be clearly seen that for which they cared most; under "marriage" came out some most interesting facts—much relating to their personal history and what they believed. In these two associations the subject was allowed to think as she chose; in the third the association was constrained, her attention being confined to the subject named; the words used were: "Name all the causes of fire that you can;" "Give the names of all the birds you know." In the fourth was given a repetition of the first, only instead of giving a word representing

a picture, a sound, a taste, etc., the direct stimulus was given and the subject asked to write her association. Instead of saying "rainbow," a color was shown; for "thunder," a whistle was blown; for "pain," a pinprick was given; for "taste," a drop of quinine solution; for "smell," extract of ammonia was given. This test was for the purpose of ascertaining if the memory stimulated persisted longer upon direct stimulation.

Important among the many facts obtained from this test is that of the rate. The rate of association of the students was much greater. The number varied with the word given, for some suggested more vivid associations. Taking the first series as illustrative, the rate per minute was: students: "rainbow," 10.7; "thunder," 10.1; "pain," 10.1; "ammonia," 10.4; "sour," 12; criminals: "rainbow," 5.2; "thunder," 5.2; "pain," 5.4; "sour," 4.6; "ammonia," 4.8. These differences in rate appeared throughout the series. The courtesans here again showed the lowest rate.

This difference in rate is due to the fact that criminals' minds do not operate as rapidly; they have a smaller fund of general knowledge from which to draw associations, and they discriminate more in what they write down. The difficulty with which they write the words delays them in recording their associations.

The route of association is also interesting. There were three or four possible ones. In the first the association always went back to the word given, that is, all other ideas were related to "rainbow," for instance. In the second, one idea would grow out of another. Thus "rainbow" would suggest "blue," "blue" the color of a ribbon, "ribbon" on the subject's hat, etc., the idea of "rainbow" being entirely lost. The third was where these two were combined. The fourth was a word-association; thus: "lemon" would suggest "lemonade," or "sweet" would suggest "sour" or "bitter." The students showed a greater tendency toward the second. This was true, I think, because they often reproduced whole scenes or events, while the criminals adhered more closely to descriptions or enumerations of the subject given. Word-associations were rather more frequent among the delinquents.

The varying associations for the same word brought out by the two classes were most interesting. Noticeable, too, was the fatigue which the test produced in the criminal classes. The students were almost always fresh, while near the close the delinquents grew tired, restless, and irritable. This was true, notwithstanding their interest, which was well held by this experiment.

The last, and perhaps most interesting, test was that made with the kymograph, an instrument designed to register the respiration curve upon smoked paper. The instrument consists of a base containing a clockwork, a standard, and a drum, around which is rolled the smoked paper. The drum is revolved slowly by the clockwork. Resting lightly against the smoked paper is a pointer. A respirator is fastened upon the chest of the subject, and this is connected with the pointer by means of a rubber tubing. When the subject inspires and expires, the air is forced down and back the tube, the pointer making a curved line upon the paper as the drum revolves. Every change in the amplitude and the rate of the breathing is thus graphically portrayed.

The test was given for the purpose of determining the amount of emotional reaction to stimuli, as shown by the changes in breathing. Five curves were taken upon each sheet. In the first one the subject was asked to sit quietly and think of whatever she desired, except of the experiment. This gave a fairly regular curve. Where there were any marked depressions or elevations I stopped the kymograph and asked for the corresponding thought, which was rarely denied. Near the close of this curve a stimulus for surprise was given. The room was quiet, the subject thinking, when suddenly a block was dropped, or a hammer struck. The change in the width, height, and regularity of the curve showed the amount of reaction. These changes are made by the subjects breathing more quickly or slowly, by catching or holding the breath. The second curve was designed to secure as nearly as is possible the normal curve. For this the subject was asked to read a newspaper clipping. It had no beginning or end, and was selected to hold the attention, but



not to excite undue interest. The mind being off of the self and the experiment, the curve was usually even. Near the close of this the stimulus for pain was given. For this was used a sharp pinprick in the back of the neck. The change here was usually a sharp rise or fall, and the return to the normal curve was more quickly made than in surprise. The next curve was the reading-aloud curve. This was given for the purpose of noting the difference between the various methods of reading. Note was taken of the rapidity, monotony, attention to pauses, etc. This test also served to relieve any tension still existing in the subject. The fourth curve was related to the effect of interest. In the first half the subject was required to read the ordinary crop report found in the daily paper; in the second half she was given a graphic account of the rebellion of two criminals in prison. The former was dull to her, the latter interesting. The changes here were not so marked, partly, I believe, because the crop report was too dull, and her attention wandered to more interesting things. In the last curve the subject was allowed to think of whatever she chose, until I suggested the train of a stimulus thought. I gave first one for joy, suggesting that she think of being released. This almost never failed, the curves being deeper and wider. The second was for disgrace, and for this I used the fact of her being in such an institution and its effect upon relatives and friends. This did not secure so marked a response as did the first, but here I secured three genuine crying curves. Such curves as these, as well as those for laughter, sighing, etc., must come unexpectedly and voluntarily, and cannot be secured for the asking. The last was that for fear. For this I used a simple device. Placing a plethysmograph near the temple, I said I intended applying an electric current; that if they would not move or speak the pain would be slight. The fear of electricity is very great, and this never failed. My great difficulty was in keeping them quiet, so excessive was this fear. Two marked changes were observable: either the curve became almost a straight line, as when they held their breath, or it became ragged and of varying amplitude, as when they became nervous through fear.

These results I have not yet compared, so I am unable to say in what they differ from those of the students.

All of the psychological tests show a marked difference between the immoral women, who are those generally found in workhouses, and the women who commit felonies, who are those generally found in the penitentiaries. If the results from the technically criminal class were considered separately from those of the workhouse class, the average would be higher. The prostitute mentally and physically is more defective than the criminal. Where the differences between the two classes have been great I have separated them, giving the average for each, or calling attention to the fact of the difference.

I have here presented, as briefly as possible, the experiments, methods, and results. There remains now the presentation of the results of the sociological investigation, and the correlation of the two—the application of the one to the other, and the relation to social phenomena.

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[*To be continued.*]